The Impact of Globalization on the U.S. Dairy Industry: Threats, Opportunities, and Implications

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Preface

The Innovation Center for U.S. Dairy, with staff assistance from Dairy Management Inc. (DMI), and the U.S. Dairy Export Council (USDEC), has prepared a strategic analysis of the global dairy landscape in order to find a common understanding of the challenges, opportunities and threats to the U.S. dairy industry posed by increasing globalization. This document is a summary of a broader set of work and analyses that is intended to provide objective information and facilitate important discussions on the present and future impact of globalization on the U.S. dairy industry. The goals of this document, with the support of the broader analysis, are as follows:

- Primary: to provide a **strategic analysis of the global dairy landscape** and establish a common understanding of the challenges, opportunities and threats posed by increasing globalization to the U.S. dairy industry
- Secondary: from the analysis, to determine if there are **suitable programs** of work at an industry level to address the opportunities and challenges of globalization, and thus help U.S. dairy industry participants be better prepared to compete for increased sales in the global dairy marketplace, including dairy demand in the U.S.

This project included interviews with numerous stakeholders throughout the dairy value chain, both within the U.S. and across a number of regions of interest; interviews with dairy consultants in various parts of the world; and the use of publicly available information and reports from a variety of sources. This document is intended to assess global dairy industry trade dynamics to help create and support a framework for discussion and debate among institutions that participate in the U.S. dairy sector. Information and analyses herein are based on third-party sources. Projected market and financial information, analyses and conclusions should not be construed as definitive forecasts or guarantees of future results. These analyses form the basis for recommended actions that the U.S. dairy industry might implement for its collective benefit. Therefore, any party considering action on the basis of the analyses provided in the document should independently determine which course of action is most reasonable in the context of its own economic situation.

This document, prepared by the Innovation Center for U.S. Dairy, contains research and analysis conducted with the support and assistance of Bain & Company, a global management consulting firm.

Executive summary

Introduction

World dairy demand in 2007 and 2008 exposed the U.S. dairy industry to the opportunities and challenges of a globalizing marketplace. Few dairy players escaped the impact of rapidly growing international trade and U.S. participation in dairy exports reached historic highs. Sensing that globalization would be an ongoing force shaping the dairy industry in the future and concerned that the U.S. might not be fully prepared to deal with a rapidly changing dairy landscape, the Innovation Center for U.S. Dairy commissioned a study on the topic of globalization. The strategic assessment of the global dairy landscape and its impact on the U.S. dairy industry was led by a task force comprised of dairy industry leaders and supported by Bain & Company, a global management consulting firm.

Few industry participants forecasted the confluence of factors that would lead to economic crisis in the dairy industry late in 2008 and into 2009—a supply/demand squeeze that sent prices to historical highs when a global recession sharply dampened consumption just as dairy herds reached their peak. The result was excess output washing over markets and crashing prices. It would have been easy to ignore the topic of globalization, but industry leaders understood that the trends driving the globalization of dairy markets run deeper and broader than the current economic crisis. In fact, as the Globalization Task Force probed the issue of globalization, it became increasingly apparent that the industry needs to take action now in order to prepare for the opportunities and challenges that are almost certain to emerge in the coming years as a result of continuing globalization trends in dairy markets.

Key Findings

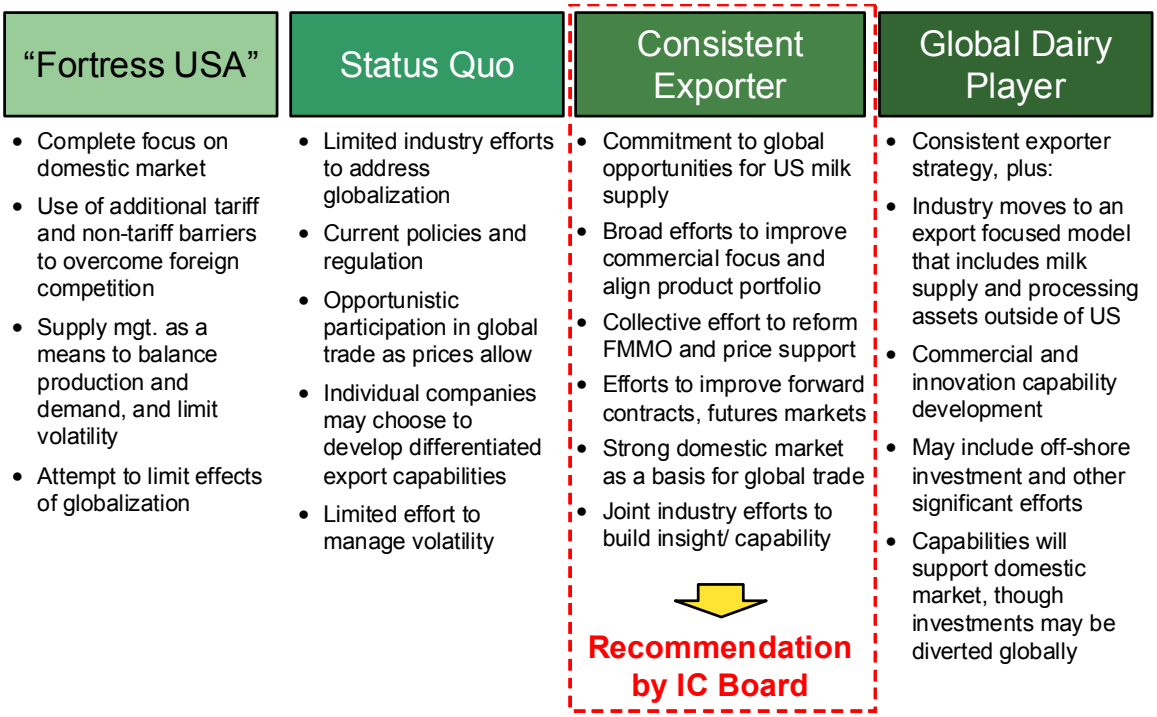
In broadest terms, globalization's impact is pervasive enough to affect all domestic dairy companies throughout the value chain whether or not they choose to directly participate in international dairy trade. Clearly, as the dairy economy of the past 2 years demonstrates, world economic factors will affect dairy pricing in the U.S. And, while not the market that will deliver the most robust growth over the next 5 to 8 years, the U.S. internal market totals over 16% of world dairy consumption, the largest single market outside the European Union. Consequently, any successful long-term global strategy for U.S. suppliers must also focus attention on its huge internal market for U.S. produced dairy products and ingredients.

Regarding the important and faster-growing international market, the study projected that net import demand for dairy products would grow faster than net export supply through 2013, with demand growth coming primarily from developing economies in Asia, Latin America, North Africa and the Middle East. This will lead to a "latent demand gap" (global shortfall between consumption and production forecasts) of ~100,000 metric tons of dairy protein by 2013 (equivalent to ~7 billion pounds of milk). Importantly, the U.S. is a country that can be well-positioned to capture the opportunity of filling the demand gap in the near term (10-15 years). Beyond this 10-15 year window of opportunity, new sources of low cost supply will deliver significant quantities—thus, there is a need to take action to ensure that U.S. industry builds a long-term competitive advantage to ensure its place in the global market.

More specifically, eight key themes emerged from the analysis:

1. Globalization of the dairy industry will increase in the coming years, with significant impact on domestic and international trade
2. Demand for dairy products will grow faster than available supply, driven disproportionately by economic growth in emerging markets
3. Traditional sources of supply will struggle to keep pace with growing dairy demand, creating a *latent demand gap*
4. Global imbalances will create increasingly volatile dairy markets, as processors will need to compete across borders for milk supplies
5. Shortage of global supply creates internal and external growth opportunities for the United States
6. To capture this opportunity, the U.S. dairy industry will need to leverage existing capabilities and invest in strengthening specific competitive weaknesses
7. Inaction, in the face of global change, will lead to a less competitive U.S. industry and will limit growth opportunities across all elements of the value chain
8. Longer term, new low-cost sources of supply (for example, Brazil and Ukraine) will compete for a larger share of the global opportunity, creating a finite window for the U.S. dairy industry to establish a defensible competitive position.

Based on the insights derived from the strategic assessment, the Globalization Task Force outlined a range of strategic options for the U.S. dairy industry. These options included:



After detailed consideration of each option and its impact across the dairy industry, now and in the future, the Task Force and ultimately the Innovation Center Board of Directors recommended that the U.S. dairy industry pursue the "Consistent Exporter" strategy. This option provides the U.S. dairy industry with the clearest path towards strengthening its position both domestically and internationally, while creating opportunities for future industry growth. The Task Force also completed a financial assessment of each option, and the "Consistent Exporter" strategy provided the greatest risk-adjusted financial benefit for the industry. A more detailed review of each option and the logic for the final selection of the "Consistent Exporter" strategy is discussed in further detail later in this paper.

In order to realize the benefits of the "Consistent Exporter" strategy, it is critical that the dairy industry pursue a focused set of company and industry actions. These actions must leverage the inherent strengths the industry currently enjoys and bolster shortcomings versus other global dairy suppliers to take advantage of the opportunities and protect the industry against the long-term threats. Globalization's impact is pervasive enough to affect all domestic dairy companies throughout the value chain whether or not they choose to directly participate in international dairy trade. A "do-nothing" strategy is both insufficient and dangerous to the health of the sector.

Strategic Assessment

1. Globalization of the dairy industry will increase in the coming years, with significant impact on domestic and international trade

Global dairy trade has undergone a significant transformation over the past 20 years. Similar to many other commodity businesses, the dairy industry is an increasingly integrated network of markets and suppliers. The confluence of increased demand for dairy products in non-producing regions, reduced trade barriers, improved production, processing and logistics capabilities of suppliers and emergence of global dairy companies has led to increasing levels of global dairy trade from an unprecedented number of sources. Even with the increase in globalization, the global dairy market continues to be largely dependent on local production and consumption, especially in the fluid milk market. Although the majority of dairy is consumed locally or regionally as fluid milk leading to relatively thinly-traded global markets focused mainly on ingredients, increased global trade nonetheless has influenced the dynamics of domestic markets in dairy producing regions.

Looking ahead, the next 20 years promise to be equally dynamic for dairy. As dairy demand increases in geographies that are unable to meet demand with local production, demand for imports in these areas will increase. This affects these local domestic markets as they see increased overseas competition and impacts global markets as international suppliers seek to maximize their return.

2. Demand for dairy products will grow faster than available supply, driven disproportionately by emerging markets

Driven by population and economic growth and improvements in living standards, the number of middle class consumers in emerging markets will triple, reaching over 1 billion people by 2030. As this population's discretionary income increases, they will consume more animal protein in their diets, including more dairy products.

While dairy supply in many emerging markets will also see dramatic improvements, forecasts indicate that production will not be able to meet demand, resulting in higher demand for dairy imports on a global scale.

3. Traditional sources of supply will not be able to fully meet growing dairy demand

Today, more than 8 million Metric Tons (MT) of dairy products are traded globally. New Zealand, the EU, Australia and the U.S. are key suppliers of dairy exports, shipping product to major importers in Asia, Latin America and the Middle East.

However, in the future, traditional sources of international supply will struggle to meet growing demand. Australia is near maximum production capability with a mixed pasture and feed-based model that has reached its limits due to serious water limitations and a decade or more of drought that has structurally shifted water usage away from dairy. NZ will continue to be a dominant exporter and can grow to meet a portion of future demand but, when the current pasture-based model reaches its natural production limits, moving to a feed based model would place Oceania at a higher cost position than the U.S. We estimate that NZ can grow capacity approximately another 30% under the current model. Although U.S. milk production costs are much higher than most dairy exporting countries ($485/MT in Wisconsin vs. $287/MT in New Zealand according to 2008 IFCN estimates), the U.S. marginal cost of production is actually lower than traditional exporters. Because of the capacity constraints caused by limitations on land and water, New Zealand and Oceania will be unable to grow supply to fully meet global demand. Additionally, traditional export giant, the EU, is forecast to produce a relatively flat supply of milk supply over the next 5 years and exports will actually reduce as internal EU demand grows.

As a result, net import demand for dairy products is projected to grow faster than net export supply through 2013, with demand growth coming primarily from developing economies in Asia, Latin America, North Africa and the Middle East. This will lead to a "latent demand gap" (global shortfall between consumption and production forecasts) of ~100,000 metric tons of dairy protein by 2013 (equivalent to ~7 billion pounds of milk).

4. Global imbalances will create increasingly volatile dairy markets, as processors must compete across borders for milk supplies

While the prospect of a latent demand gap creates an opportunity for producers that can expand production to meet the demand, challenges remain. The past decade has seen more volatile dairy markets, driven by increasing global demand, tighter global supply and rising input prices.

The forecast latent demand gap described above will likely lead to *even more* volatile markets, with large price swings caused by supply/demand shortages across various geographies. This volatility will significantly impact both international and domestic dairy players in the U.S., with similar effect as the price swings between 2007 and 2009. Identifying ways to limit volatility (or more likely, mitigate the effect of volatility) is crucial to any future dairy strategy. The way the U.S. plays in the global market will have a significant impact on volatility. A more proactive attempt to maintain a higher export presence may lead to lead volatility.

5. Shortage of global supply creates internal and external growth opportunities for the United States

The U.S. is well-positioned to grow share in the face of global supply shortages by displacing imports in the local market and increasing exports to other countries. Two types of external growth opportunities exist for U.S. dairy exporters. The first is to capture the full breadth of import demand growth in regions where the U.S. is highly aligned with the customer market (e.g., Mexico). A second growth opportunity also exists for U.S. dairy exporters to capture latent demand gaps for dairy products that will emerge across the remaining global market. As each exporter fills the needs mainly of their most attractive (aligned) markets first, there will be unmet demand that will remain unfilled (varying by market and by product type). It should also be noted that, while globalization creates external opportunities, this opportunity is relatively small when compared to the overall U.S. domestic market. It is imperative that the U.S. industry strategy to grow exports also supports growth in the domestic market through improved capabilities, product offerings and competitive position.

6. To capture this opportunity, the U.S. dairy industry will need to leverage existing capabilities and invest in strengthening specific competitive weaknesses

The U.S. is possibly the only country positioned to capture the opportunity of filling the demand gap in the near-term (10-15 years); however, it must first decide the most appropriate course of action to take as an industry. In order to compete successfully, suppliers must possess a set of core milk and dairy product supply capabilities, many of which are focused around a customer-centric market approach:

- Growth potential
- “Low enough” cost
- Production consistency (year-round)
- Tight quality assurance specifications (including traceability)
- Products customers want (product innovation, tight quality assurance, and traceability)
- Customer service/sales capabilities
- Commitment to long-term relationships—supply consistency to global customers
- Technology innovation
- Volatility mitigation/contract pricing

The Task Force interviewed leading global and regional buyers of dairy products, and from these a nearly consensus view of U.S. capabilities emerged. The view of U.S. capabilities was mixed but, in terms of strengths, the U.S. is widely viewed as the country best positioned to fill the increasing global demand for dairy products, or the “latent demand gap”, described previously. This is based on the United States’ growth potential, production consistency across

regions, geographic diversity of supply and product quality, all of which are considered strengths (or areas of parity) of U.S. dairy. From a cost perspective, the U.S. is currently “low enough” to be competitive.

However, buyers have also voiced concerns about whether the U.S. can deliver on its potential. Specifically, commercial capabilities, commitment to global markets, tighter quality assurance, lack of innovation/R&D, regulated pricing and misaligned product portfolio were cited as issues that the U.S. must address in order to become a leading exporter. Additionally, the U.S. will need to continue to come down the cost curve and develop other commercial/customer differentiation to maintain its competitiveness in the long-run.

7. Inaction will lead to a less competitive U.S. industry

As the dairy industry becomes more global, the U.S. industry must react to the changing market or risk becoming less competitive and face a future of flat to negative growth and industry stagnation. Inaction will lead to several consequences in the short-term and long-term.

Potential consequences of inaction in the short-term:

- Latent demand gap will result in some price recovery
- However, price volatility will continue to whip-saw the domestic market
- Food processors will start to limit dairy usage due to high/volatile prices
- Industry participants will make sporadic investment in technology and product innovation
- The industry will suffer from a relatively static product portfolio
- There will be only opportunistic development of commercial capability
- There will be only limited policy/regulation reform
- Growth opportunities will be limited
    - Slowing domestic growth
    - Export growth less than demand
    - Limited import substitution

Potential consequences of inaction in the long-term:

- High volatility will persist, impacting market growth and stability
    - Peaks will drive higher substitution
    - Troughs will be painful and may reduce market investment
    - U.S. as marginal player will add volatility
    - Risk associated with high level of volatility will result in higher overall costs and lower competitiveness (i.e., higher risks require higher rewards to justify investment)
- Erosion of U.S. competitiveness
    - Lag industry leaders (Oceania) in innovation and commercial capabilities
    - Higher cost than emerging market supply with no differentiation
    - Less investment in capital, talent, innovation
- Lack of U.S. ability to meet emerging demand will increase speed of entry of low-cost competition
- Risk of flat or even declining domestic market (and diminished international trade)
- Risk of importers targeting domestic U.S. market as trade barriers decline

8. Longer term, new low-cost supply (Brazil, Ukraine) will compete for a larger share of the global opportunity, creating a finite window for the U.S. to establish a defensible competitive position

The U.S. is currently at a competitive advantage relative to the key emerging sources of dairy, such as Brazil and the Ukraine, which are struggling with economic and political instability, as well as issues of quality and reliability. Therefore, the U.S. has a unique and strategic opportunity over the coming decade to establish a leading position as a global provider of dairy products due to its own capabilities and the limitations of its competitors.

However, these emerging dairy producers have significant capacity to expand low-cost production. This means that, in the long run, the U.S. dairy industry will face significant competition from emerging producers. In order for the U.S. to remain a significant exporter in the long-run and protect the domestic markets from low competition, the country will need to develop a value proposition to access most markets at a premium. While continuing cost reduction remains a laudable goal, it would need to move down dramatically to level the playing field competitively. Without an effort to improve capabilities and establish a strong competitive and commercial position in the value-added end of the market the U.S. risks being "stuck in the middle" as a higher cost, lower capability/quality supplier of dairy products. We view the window of opportunity to be in the 10-15 year before low cost supply emerges in significant quantities. This window may, in fact, be narrower if we return to a period of high prices which could hasten the emergence of a competitive source of low cost supply—thus, **there is a need to take action**.

Strategic options

Based on the long-term emerging dairy needs in the global marketplace and the accompanying latent demand gap, a number of potential strategic options that could better position the U.S. dairy industry both at home and abroad were considered. We outlined four options below that were considered across a range of positions relating to the global dairy market trends.

I. **"Fortress USA"**: in this scenario, the U.S. dairy industry would focus exclusively on the domestic market. In an attempt to lessen the impact of global dairy trends, the industry would push for more tariff and non-tariff trade barriers to mute the impact of foreign competitors. It is not clear that these increased barriers are attainable, given existing trade commitments and the high cost of adjusting barriers upward under those commitments. To balance domestic production and demand, and limit price volatility, the industry would advocate for stronger supply management.

II. **Status Quo**: in this scenario, current policies and regulation would be left more or less untouched, allowing opportunistic participation in global trade as prices and supply/demand allow. Individual companies would choose to develop differentiated export capabilities but there would be limited collective industry effort to address dairy globalization or to find ways to manage volatility. Choosing this option, if appropriate, should be a conscious industry choice, not left to the simple inertia of inaction.

III. **Consistent Exporter**: in this scenario, the industry would collectively commit to pursue internal and external opportunities for U.S. milk. Industry level activities would likely include:
   a. Broad efforts to improve commercial focus and align product portfolio
   b. Collective efforts to reform FMMO and price support programs
   c. Efforts to improve forward contracts, futures markets and other risk management tools
   d. Joint industry efforts to build insight and capabilities needed to compete globally

   Efforts to strengthen the U.S. dairy industry to compete globally would develop skills, capabilities and products that would also strengthen the industry domestically.

IV. **Global Dairy Player**: in this scenario, all the efforts described in Option III above would apply, but in addition:
   a. The industry would move to an export-focused model that might include milk supply and processing assets outside of US
   b. There would likely be collective commercial and innovation capability development
   c. More support of off-shore investment and other significant efforts.

   These added capabilities would support domestic market, but investments might be diverted globally versus being focused within the U.S.

As U.S. dairy formulates a go-forward strategy, it needs to consider what role dairy policy plays in the industry's ability (or lack of ability) to successfully execute the strategy. Many of the current capability gaps that exist today in the U.S. are due to the long-term, cumulative effects of U.S. dairy policy, including the U.S. Dairy Product Price Support Program (DPPSP) and Federal Milk Marketing Orders (FMMO). Over time, both have hindered many of the incremental adaptive changes that would have enhanced global industry competitiveness. DPPSP has limited the U.S. dairy industry's product adaptations and specifications that have become global norms. With the government as a "backstop" customer, producers and processors have less need for commercial capabilities. In this way, the DPPSP has incented the U.S. dairy industry to be a residual supplier of global ingredients at lower values and narrowed the channels where U.S. dairy commodities satisfy primary customer needs. Additionally, FMMO has led to increased price volatility, as it has limited the opportunity for the utilization of a well-developed forward/futures market for milk. While these federal programs have benefited the U.S. dairy industry in other ways, their role will need reconsideration if the U.S. intends to play a more active role in the global dairy market.

Strategic recommendations

Having run a number of analyses to compare the likely outcomes of these different scenarios, the task force came to the following conclusions:

I. While **Fortress USA** theoretically appears attractive in the near-term, there are both short-term and long-term concerns with this strategy. The Globalization Task Force believes this strategy would ultimately damage the U.S. dairy industry. In the near-term, the feasibility of successfully implementing a Fortress USA strategy is extremely low for two primary reasons: (1) it will be extremely difficult to put in place

a supply management system that would effectively address volatility in the industry and adequately anticipate new market demands; and (2) a true Fortress USA strategy that would protect the domestic industry would include increasing tariffs and other barriers to limit the impact of imports/exports, which is difficult to do effectively enough to prevent substantial import "leakage" and would face strong resistance due to the WTO-imposed ramifications on other agriculture sectors . Thus, based on a risk-adjusted financial analysis, the Fortress USA strategy creates the least value of the four strategic options considered for the industry. Longer-term, this strategy would have drastic implications on the dairy industry as a result of pursuing a "closed market" strategy:

a. Lack of growth
    i. Negative impact on dairy consumption at the consumer level
    ii. Broad lack of innovation, leading to stagnation
    iii. Substitution of dairy for other ingredients by CPG companies
b. Rising costs
    i. Higher cost structure due to creeping inefficiencies, depressing producer margins, pushing prices even higher
    ii. Less focus on cost and productivity
    iii. Increased oversight and regulation
    iv. Less investment
c. Weaker industry
    i. Actions do not benefit the broader industry
    ii. Vulnerability to imports as inevitable loopholes are exploited (or if the trade barriers are ever taken down)
    iii. A stagnant and inward looking industry

II. Changing the industry's present practices will require significant effort, and to some members of the dairy industry maintaining **"the Status Quo"** is a comforting option. Familiarity with the imperfections of the current system can make a Status Quo option appear preferable to the risk and uncertainty associated with industry change, especially during times of economic stress. However, over the long-term, adopting a "do-nothing-more" strategy will:

a. Fail to address the core issues around excessive dairy price volatility that damage everyone in the supply chain and discourage investment;
b. Fail to improve the U.S. industry's chances to fill the global latent demand gap in dairy. This will limit the U.S. industry's ability to grow and will encourage accelerated development of low cost sources of supply in countries like Brazil and Ukraine to fill the global demand gap;
c. Diminish the U.S. industry's ability to compete globally by exacerbating the commercial, marketing and innovation gap relative to Oceania and Europe
d. Leave the U.S. dairy industry more exposed to increased imports domestically and increased ingredient substitution by food manufacturers;
e. Confirm to major buyers that the U.S. is generally content to remain a marginal participant in global markets as a periodic supplier of commodity products.

Many of the steps to make the U.S. more competitive globally (internally and externally) require more than company-level efforts—failing to address industry-wide programs represents a missed opportunity for the industry that may not return.

III. The "**Consistent Exporter"** appears to be most attractive of the scenarios considered, with a higher estimated present value to the entire U.S. dairy industry versus the Status Quo scenario, and with the greatest potential for growth and future profit. The benefit of the Consistent Exporter approach is an improved ability for the market to access international export opportunities while increasing the capability to meet the needs of the domestic market. Company and industry actions focused on enhancing our strengths and fortifying against our competitive weaknesses will lead to a more competitive and capable U.S. dairy industry:

a. **A customer-centric market approach**, developing deeper and stronger relationships at all levels of customer organizations, leading to collaborative innovation, product development and sustainable relationships
b. Develop the capabilities to **make the products our customers** want
c. **Focus on innovation** and leading-edge product development, creating a sustainable market position globally with more value added products
d. **Focused effort to reduce costs and increase efficiency** of U.S. milk sheds, to maintain a "low enough" cost to compete globally
e. **Create a safety and quality assurance program** that builds a sustainable competitive advantage against emerging dairy markets
f. Develop tools for the market to **manage volatility**, supporting producers on the cost side and processors on the selling side
g. Targeted efforts to **develop global markets** that are attractive for U.S. dairy companies
h. Aligned industry efforts to **address structural policies and programs** that limit ability for the U.S. to invest in global opportunities

IV. The **"Global Dairy Player"** scenario was deemed as a premature industry strategy at this point by the Innovation Center board, which indicate it might be considered after progress has been made on the Consistent Exporter opportunity. The set of capabilities necessary to be successful as a Global Dairy Player include, as a sub-set, the same capabilities necessary to be a Consistent Exporter. There was agreement that there may be companies better positioned to move in this direction, though the industry should focus on building the necessary foundation as a step toward these opportunities in the future. Thus, the Board recommended to focus on the capabilities necessary to become a Consistent Exporter first, leaving open the possibility of expanding the role of the U.S. dairy industry at a global level in the future.

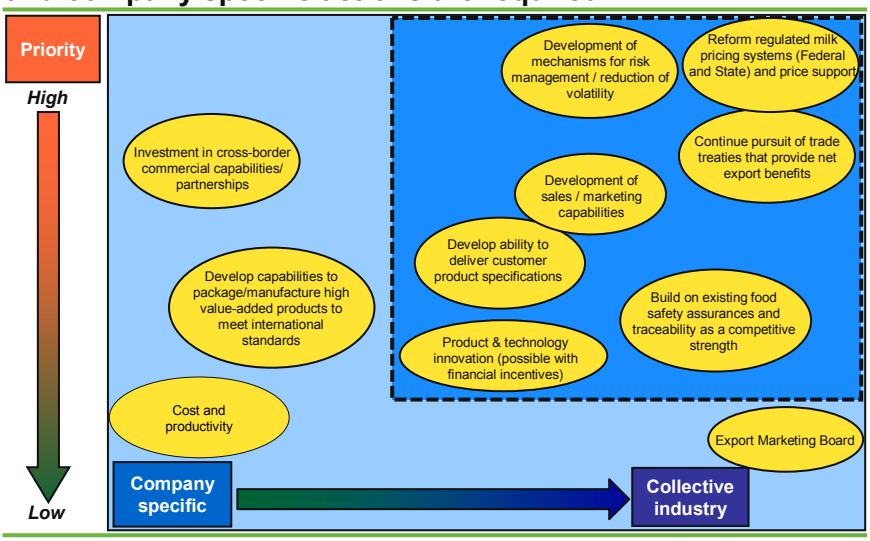
Conclusion

In summary, the U.S. dairy industry should pursue a focused set of company and industry actions to benefit from a future of increased globalization. The trends underlying increased globalization run deeper and broader than the current economic downturn and there is a finite window in which the U.S. has the opportunity to strengthen its competitive position and capture the latent demand gap. A "do-nothing" strategy is insufficient, and likely to be harmful to the industry's potential for future success.

A strategy of becoming a more **Consistent Exporter** will create opportunities not only in international markets, but also within the U.S. domestic market. An industry that is strong and commercially focused will drive growth and profit in domestic and international markets. Making the changes necessary for success in the future won't be easy. They will require industry actions to leverage strengths and bolster industry shortcomings. This will include efforts to fundamentally address barriers to success that have deep roots in the industry, including price support, the FMMO/Classified pricing system policies and possibly standards of identity. In parallel, individual U.S. dairy companies should utilize the insights from the globalization study and ongoing industry resources to strengthen their competitive position and pursue opportunities in the best interest of their relevant stakeholders.

In an effort to move from analysis to action, the Globalization Task Force deemed seven potential programs of work to be of broad interest and application ("Collective Industry") and higher priority. These are:

To achieve the "Consistent Exporter" strategy, both industry and company specific actions are required



I. Reform of the regulated milk pricing systems (Federal and state) and the price support mechanisms
II. Development of better mechanisms for risk management and reduction of volatility
III. Continued pursuit of trade treaties that provide net export benefits
IV. Analysis and prospective redirection of industry's global, pre-competitive sales and marketing investments and capabilities
V. Build on existing food safety assurances and traceability as a competitive strength
VI. Develop better ability to meet customer product specification requirements globally
VII. Encourage increased product and technology innovation

Thus, the Task Force recommends that Industry collectively pursue these high-priority programs of work through the Innovation Center, or other appropriate forum, to ensure that the U.S. dairy industry meets the forces of globalization from a position of competitive strength, and builds the potential for future dairy growth and prosperity.

Supplemental Data from the Strategic Factbase

Global dairy supply and demand

Global dairy trade has undergone a significant transformation over the past 20 years. Similar to many other commodity businesses, the dairy industry is an increasingly integrated network of markets and suppliers. The confluence of increased demand for dairy products in non-producing regions, reduced trade barriers, improved production, processing and logistics capabilities of suppliers and emergence of global dairy companies has led to increasing levels of global dairy trade from an unprecedented number of sources. Even with the increase in globalization, the global dairy market continues to be largely dependent on local production and consumption, especially in the fluid milk market. Although the majority of dairy is consumed locally or regionally as fluid milk, leading to relatively thinly-traded global markets focused mainly on ingredients, increased global trade nonetheless has influenced the dynamics of domestic markets in dairy producing regions.

As recently as the early 1990s, the European Union (EU) was the global leader in dairy trade. However, Oceania (New Zealand and Australia) has since supplanted the EU as the world's leading dairy exporter by leveraging their low-cost position and increasingly global capabilities. Led by the efforts of Fonterra and operating in recently deregulated domestic markets, Oceania has developed a leading export position to many key dairy markets, including China, Southeast Asia and Latin America. With dairy supply capacity now far in excess of its domestic consumption needs, New Zealand has created a dairy industry that is highly focused on being world class in serving dairy needs outside its borders.

Looking ahead, the next 20 years promise to be equally dynamic for dairy. Driven by population growth and dramatic improvements in living standards, the number of middle class consumers in emerging markets will triple, reaching over 1 billion people by 2030. As this population's discretionary income increases, they will consume more animal protein in their diets, including more dairy products. At the same time, the demand for dairy in more established markets such as Europe, the United States and Japan will continue its slow growth given the maturity and stability of economic and population growth. Consequently, emerging markets in Asia and other parts of the world will be the key battleground for dairy industries seeking growth through exports. Though recent global economic events have temporarily interrupted these trends, they are immutable and will resume as economic stability returns.

Who Will Be Net importers of Dairy Products?

Asia

Driven by rising incomes and an increasingly urban population, **China** has become a significant player in the global dairy market. China's dairy consumption is expected to increase at approximately 10% annually in the coming years, although some degree of volatility in demand is expected from year to year due to the nature of China's economy. Though China accounts for approximately 6% of worldwide raw milk production, it has 20% of world population and growing per capita income. Thus, in spite of astounding recent growth in its own raw milk production, it has had to rely on imports to meet its consumption demands. China's future production may continue to grow, however limitations exist due to unproductive herds, limited arable land, clean water constraints, and a poor chilled supply chain infrastructure. Looking ahead, net imports are expected to rise as China's production is not able to keep pace with consumption.

Though it represents only 2% of global consumption, **Southeast Asia** accounts for over 13% of worldwide dairy imports due to its limited production. Regional raw milk production is used almost exclusively to meet the demand for fluid milk, which has been growing at more than 7% annually since 1997. Therefore, nearly all non-fluid goods are imported. Going forward, there is high potential for additional consumption and net import growth. Consumption is expected to grow at a range of 4-9% annually depending on the country, as average income is expected to increase at rates from 7 to 14% annually across the region. Production will continue to fall short of domestic demand mainly due to the region's hot and humid climate, which is not conducive to high cow yields.

Due to population and strong dairy culture, **India** will continue to be the world's largest consumer of dairy products, despite relatively low GDP per capita. India also has the world's largest dairy herd, although it is relatively unproductive because average ownership is only 1-2 cows (or buffaloes). Third party consumption and production forecasts for India imply that it will become a significant importer of dairy products. However, this outcome is unlikely to occur due to strong political and cultural pressure to protect the domestic dairy industry. India has a well-established history of protecting sectors which drive significant employment, and dairy falls strongly into this category. Because of these factors, it is more reasonable to forecast that India's domestic production and consumption will grow at similar rates going forward, either due to further increases in production or suppressed consumption via price increases caused by government intervention. Given the conservative approach this analysis has taken to assessing future market opportunities, India is not considered a significant export opportunity.

Japan is unlikely to support future export growth opportunities for the U.S. dairy industry, though there may be selective opportunities for specific products at the company level. Japan actively protects its dairy industry through high tariffs, quotas and government subsidies to farmers. Despite repeated attempts by other countries to open up Japan's dairy market, Japan has not reduced tariffs as part of free trade negotiations. Japan has had recent supply issues with Oceania, which, if the issues recur, may present a short-term opportunity for some U.S. dairy suppliers.

Russia

Accounting for 13.5% of global dairy imports, Russia is a one of the largest markets for international dairy trade. The increasing price of oil in recent years has played a key role in driving up Russian dairy consumption. As oil prices crept higher, incomes increased and per capita dairy consumption rose to levels not seen since before the Russian financial crisis in 1997-1998. However, the dramatic fall in the price of oil over the past year, as well as the global economic downturn, has shown how quickly and dramatically Russia's economic fortunes can change. Some sources believe that Russian dairy imports will increase over the next 10-15 years because production is not expected to keep pace with consumption. However, the Russian government has communicated a concerted dairy program to support the development of their production capabilities. Doubts remain about the efficacy of these programs, as funds have been limited due to the economic situation for the government. Local sources in Russia predict a long road ahead to develop wide-spread, proficient dairy production beyond pockets of areas supported by local government funding. Thus, imports will remain significant in Russia with the potential for a slight increase or decrease from current levels depending on the economy.

Rest of World

Other notable dairy import markets include **Mexico**, **Canada**, **Algeria** and **Saudi Arabia**, which together account for 19% of global dairy imports. Mexico is expected to increase its net imports in the foreseeable future as consumption outpaces production, along with Mexico's pro-trade policies making it a good opportunity for dairy exporting countries, especially the United States. Mexico will have demand growth across all non-fluid dairy products leading to an increased need for cheese, butter and SMP/NDM imports. Similarly, Algeria and Saudi Arabia represent good exporting opportunities due to their steadily increasing consumption levels and reliance on and openness to dairy imports. Canada, on the other hand, is highly protective of its dairy industry and uses tariff-rate quotas and strict product requirements to limit imports. It is unlikely that Canadian policies will change in the foreseeable future, thus limiting its impact on global dairy trade.

Beyond the above identified net importing countries, there are additional small countries that we have grouped into a "Rest of World" category. Cumulatively, consumption and production have been stable in these geographies and are expected to grow slowly over time. These geographies currently use imports to fulfill 30% of their consumption needs, and the need for imports is expected to continue for the foreseeable future.

Who Will Be Net Exporters of Dairy?

Oceania

Accounting for 8% of global exports, **Australia** is a major player in international dairy trade. Australia's dairy industry enjoys a low-cost position relative to many of its overseas competitors, which enables it to compete successfully in international trade. This is primarily due to the dominance of pasture-based dairying in Australia, which dramatically reduces feed and labor costs relative to supplemental feed-based dairying operations. Though Australia is an established dairy player, future production and export growth are limited due to Australia's vulnerability to droughts and other water availability issues. With its limited supply growth capability, a continued shift is likely toward higher-value products to serve customers in Asia. This could include cheese as well as higher-value added powder products.

New Zealand is the world's largest net exporter of dairy. Similar to Australia, it leverages its pasture-feed, low-cost position and vertical integration to compete successfully in overseas dairy markets. While New Zealand has successfully grown its dairy production and exports in recent decades, future growth will likely see limits imposed by a scarcity of suitable land and an inability to further increase cow productivity beyond current levels. New Zealand has the potential to increase total production approximately 30% over the next five years on the pasture-feed model, virtually all of which will move overseas. Yet, further growth beyond that will require switching to supplemental feed. Though New Zealand could increase production by supplementing pasture feed with maize silage in the short term, it will come at a much higher cost and require higher payout per milk solid to support conversion. In the long run, New Zealand would need to convert to 100% grain-feed for continued growth, which would come at a dramatically higher cost due to imported grain and ancillary labor costs. Therefore, New Zealand will not significantly increase its low-cost production or exports beyond 2013.

> *Fonterra*
>
> Fonterra is New Zealand's largest dairy processor, with a 95% market share of New Zealand's dairy supply and a 35% share of all global trade. Fonterra's stated strategy is to be a multi-origin, low-cost provider in high growth markets. In addition to its dominant

presence in New Zealand, Fonterra has a global manufacturing footprint that spans five continents. Despite its success, Fonterra faces several challenges going forward, including managing members' differing views on strategic direction, environmental activism, ability to raise capital and dealing with volatility in supply/demand of dairy milk.

Europe

As the largest dairy market in the world, the **EU** plays a critical role in international dairy trade. EU production is expected to grow at less than 1% annually in the next five years as producers and processors adjust to reduced support from the government. Since EU consumption is expected to increase at a slightly higher growth rate, net exports will fall. Once the EU production quotas are abolished in 2015, domestic markets will adjust quickly to the new supply/demand equilibrium. Beyond 2015 and the quota abolishment, however, regional differences in production cost, processing capabilities, land availability and population growth will shift EUs production away from Italy, Spain and the UK to Ireland, the Netherlands, Poland and Romania.

With 2% of the world's global exports, the **Ukraine** is a small but growing player in the dairy industry. Since production growth is expected to outpace consumption for the foreseeable future, Ukraine may become a key source of dairy products on the international market. However, Ukraine's role in international dairy trade could be undermined by a struggling economy, a poor chilled supply chain infrastructure and persistent quality issues, all of which are currently significant concerns.

South America

Brazil is developing into a significant producer and exporter of dairy products. Production growth (2-4% CAGR) will be driven by both increased herd size and improved cow productivity and will outpace consumption over the coming years. Limited access to low-cost capital has led to dairy quality and supply chain issues that pose challenges for Brazilian export growth in the next five years. However, Brazil has the potential to expand low-cost production significantly to fill global demand in future years. Brazil has demonstrated the ability to become a major global player in other agricultural industries, and provided it can attract the capital required to successfully address its dairy quality and supply chain issues, we forecast that Brazil will become a major source of low-cost dairy in the next 15 years.

Argentina represents a small portion of global production, consumption and exports (3% of global exports). While Argentina is expected to continue exporting dairy products, it will not become a global production leader due to chronic economic, political and climate instability.

Uruguay comprises a small portion of global production, consumption and exports (2% of global exports). Uruguay will steadily increase its exports over the next 5 years as a result of production increasing (4% CAGR) faster than consumption (1.5% CAGR). The majority of Uruguay's exports will go to Latin America, with Mexico being the primary recipient, presuming the continuing presence of Brazilian import barriers.

Chile is a relatively small player in the global dairy market, representing less than 1% of global exports. In recent years, Chile has been a target for growth-oriented New Zealand farmers to expand production due to fertile, lower-cost land than can be found in New Zealand. Chilean productivity is already very similar to New Zealand, so farmer migration will likely not lead to significant growth in exports. While Chile has the ability to grow exports by leveraging its

numerous free trade agreements, we do not expect the growth to be significant on the global market.

United States

The U.S. accounts for 13% of global raw milk production and 17% of key tradable commodity production, which includes butter, cheese and nonfat dry milk. Driven primarily by domestic demand, U.S. production is forecasted to grow at 1-2% annually for the foreseeable future. Regarding demand, the U.S. accounts for 16% of global fluid milk and 17% of key tradable commodity consumption. Though per capita fluid milk consumption is expected to remain essentially flat in coming years, demand for butter, cheese and NDM/SMP is forecasted to increase at 2% annually for the foreseeable future.

Historically, the U.S. has been a consistent importer of cheese, while its dairy commodities have tended to move in and out of export markets as a way of dealing with excess production. However, the U.S. has a flexible and diverse supply and processing base and could be well positioned to expand production if a global opportunity were available to capture.

Trade flows

Today, more than 8 million Metric Tons (MT) of dairy products are traded globally. New Zealand, the EU, Australia and the U.S. are key suppliers of dairy exports, shipping product to major importers in Asia, Latin America and the Middle East. As economies in emerging markets grow, consumption of dairy products is forecasted to increase significantly, resulting in higher demand for dairy imports on a global scale. Low-cost exporters such as New Zealand and Australia are nearing capacity, and traditional export giant, the EU, is experiencing relatively flat milk supply, resulting in lower exports. As a result, net import demand for dairy products is projected to grow faster than net export supply through 2013, with demand growth coming primarily from developing economies in Asia, Latin America, North Africa and the Middle East. This will lead to a “latent demand gap” (global shortfall between consumption and production forecasts) of ~100,000 MT of dairy protein by 2013.

Two types of growth opportunities exist for U.S. dairy exporters. The first is to supply demand growth in regions where they are highly aligned. Mexico is projected to have a significant increase in demand for dairy products, specifically in skim milk powder (20K MT), butter (49K MT) and cheese (61K MT), and will be a large opportunity for the U.S. due to high alignment.

A second growth opportunity also exists for U.S. dairy exporters to capture latent demand gaps for dairy products that will emerge in the global market. As each exporter fills the needs of their most highly aligned markets first, there will be unmet demand that will fall in different markets depending on the product. Significant demand increases in Southeast Asia and China combined with the lack of growth in exports coming out of New Zealand and Australia will leave a demand gap in these Asia nations of an estimated 155K MT of whey product and 63K MT of skim milk powder. There will also be unmet demand for skim milk powder (11K MT) and whey proteins (29K MT) in some “rest of world” countries, primarily defined as North Africa and the Middle East. The U.S., as one of the major world suppliers of whey proteins, and with ability to ramp up production in skim milk powder, is well positioned to capture a large portion of this demand growth. The latent demand gaps for butter (57K MT) and cheese (92K MT) will likely fall entirely in “rest of world” countries, with New Zealand and Australia filling demand increases in Southeast Asia and China in these products. The U.S. has a distinct ability to quickly increase production and fill this gap, thus capturing more value in the dairy export market. However,

there is an added complexity in going after unmet demand in “rest of world” countries, because this demand is distributed across multiple countries, and consequently more difficult to capture. A latent demand gap of 152K MT of whole milk powder also exists in “rest of world” countries that the U.S. could pursue, but investments in production capabilities would be necessary, as little WMP is produced by the U.S. today.

The previous paragraph outlines the most likely future scenario for world dairy demand and supply based on current trends and today’s growth forecasts. However, U.S. dairy exporters should monitor and adapt to trends that could change the size or location of the latent demand gap. For example, if China can significantly increase production (from 7% p.a. to 9% p.a.), without domestic consumption increases, the country could increase exports enough to eliminate the latent demand gap; the converse could also occur, thereby substantially expanding the gap. Similarly, depending on the speed with which emerging markets such as Brazil and Ukraine are able to ramp up production, the latent demand gap will be larger or smaller than currently predicted. Last, there is a chance that Australia shifts production to higher value products, mainly cheese, which would eliminate the latent demand gap for this product, but increase the opportunity in SMP/NDM, butter and whey.

Cost of production

Landed cost is critical to understanding the competitiveness of the U.S. relative to various exporters. The components of landed cost include production, processing, transportation and tariffs, with raw milk production driving approximately 85% of total cost. The U.S. has a relatively high cost position relative to other exporters due to the use of feed grains. These cost levels are still “low enough” to allow the U.S. to compete as world demand increases. However, as emerging producers ramp up their ability to supply world markets, the U.S. processors will need to develop a value proposition to access most markets at a premium.

Production costs

Raw milk production costs consist of two parts: cash costs that farmers must pay out of pocket (e.g., feed, hired labor, overhead, marketing, freight/assembly) and economic costs that drive investment decisions in the long run (e.g., capital depreciation and opportunity cost of unpaid labor). Export decisions and relative competitiveness are generally based off of cash costs rather than full economic costs, as in the short-term, decisions will be made on contribution rather than long-term effect. Raw milk production costs vary across U.S. geographies, with Midwest farms having lower cash costs due to cheaper feed prices and west coast farmers having lower economic costs due to hiring more paid (vs. unpaid) labor.

Processing costs, transport costs and taxes/tariffs/export subsidies

Three other components are included in calculating total landed costs, the sum of which represents approximately 15% of total landed costs. Processing costs of raw milk are driven by scale of plant operation, yield rates of plants, plant utilization (determined by capacity and seasonality), energy costs and labor costs. These costs and relative rates of efficiency can vary significantly across countries. Overall, the U.S. has lower processing costs compared to most exporters due to better yield and fully utilized plants. Transportation costs are driven by product-specific container capacity, port-to-port distances, overland-to-port distances, energy costs and backhaul effects driven by ocean carrier logistics. As a large importer, the U.S. benefits from low backhaul rates, making it relatively inexpensive to ship products for export. Transportation costs from U.S. ports are a small portion of overall costs but this expense can almost double when including overland freight from processors located in central parts of the U.S. Taxes and tariffs

vary by country and product type and have an overall moderate effect (~10%) on total landed costs.

As WTO members, major dairy exporters face similar tariff rates across markets, yet increasing the use of regional free trade agreements (such as NAFTA) provide incremental cost savings and preferential access. Some exporters, such as the EU, provide export subsidies that lower their effective landed cost, bringing their overall costs generally in line with or lower than the U.S. Periodic use of its own, more limited dairy export subsidies can sometimes moot this effect.

Implications

Although U.S. milk production costs are much higher than most dairy exporting countries ($485/MT in Wisconsin vs. $287/MT in New Zealand according to 2008 IFCN estimates), the U.S. marginal cost of production is actually lower than traditional exporters. New Zealand and Australia are near maximum production capability with the pasture based model; after current pasture-based feed models reach their natural production limits, moving to a 100% feed based model would place Oceania at a higher cost position than the U.S. On the other hand, emerging dairy producers such as Brazil and Ukraine have significant capacity to expand low-cost production. This means that in the short-term, the U.S. has the ability to expand production to meet world demand at lower cost than Oceania, but in the long-term, it will face significant competition from emerging producers. Therefore, in order for the U.S. to remain a significant exporter in the long-run, the country will need to develop a value proposition to access most markets at a premium. While continuing cost reduction remains a laudable goal, it would need to move down dramatically to level the playing field competitively.

Wild cards

As part of forecasting how dairy trade flows will evolve in future years, it is important to consider how global consumption and economic trends could impact the industry. This analysis prioritized four ‘wild cards’ because they have the potential of driving significant change in dairy demand, supply, and comparative/competitive position. However, it is important to note that the dairy industry has been and will continue to see impacts from other factors not directly addressed in this analysis.

Currency

Currently, third party sources are expecting the U.S. Dollar to appreciate against the currencies of other key dairy exporters in coming years. If so, the current competitive advantage of traditional lower-cost dairy exporters in Oceania will increase. For Euro currency producers, a sustained stronger dollar may provide a competitive advantage. Feed costs, the largest portion of raw milk production costs, are, for the most part, not directly affected by exchange rates. Therefore, changes in exchange rates can have an impact on the relative returns over feed costs. For example, as the U.S. Dollar strengthens, a New Zealand farmer’s cost of feeding his cows on pasture (denominated in New Zealand dollars) does not change. Meanwhile, the value of the milk that he sells appreciates, increasing his returns over feed costs. Returns for an Irish producer feeding cows on pasture would similarly increase. However, given the much higher absolute cost of production in Ireland versus New Zealand, the increased return may move the Irish producer from a loss to a profit. Meanwhile, there is no change in the return to the U.S. producer.

From an import buyer's perspective, a change in currency values can have two effects. First, it can either increase or decrease the relative purchasing power since globally traded dairy products are usually sold in dollars. Thus, a stronger dollar might weaken overall demand, while a weaker one would strengthen it. Second, a global competitor such as Europe, whose cost of production is closer to—but generally higher than—that of the U.S., may become more attractive if the dollar moves up sufficiently. However, the relative attractiveness of an Oceania supplier, whose cost of production permits profitability at a lower price, would remain unchanged.

Oil

Oil prices have only a moderate effect on demand but a larger impact on the relative cost position of suppliers. With demand, countries that rely heavily on oil revenues (such as Saudi Arabia, Russia and Algeria) tend to increase their consumption during times of high oil prices. However, the effect of high oil prices on dairy consumption is modest (even when oil reaches $100 per barrel) and therefore will not be a significant driver of trade flows.

From a cost perspective, the price of oil can have a meaningful impact on trade flows. Oil is a key driver of production costs for countries (such as the U.S.) that have mostly feed-based farming systems. This is due to the strong, positive correlation between the price of oil and corn. The price of oil also impacts processing and transportation costs, but its impact is negligible. Therefore, as oil prices rise, U.S. production costs increase, differentially relative to other key export competitors such as New Zealand and Brazil. Because oil prices can move quickly and dramatically, it is important that the U.S. dairy industry develop a clear contingency plan for how to mitigate its exposure to both short-term spikes and longer-term price appreciation.

Shift to lower fat milk and dairy products

In developed markets such as the United States, France, UK and Denmark, a steady shift has occurred away from whole milk to skim and semi-skim milk. Currently, it is unclear whether consumers in Germany, Italy and Eastern Europe are also reducing their intake of milk fat. If they begin to do so, one possible implication is that butter production will increase as one way to utilize (and store) surplus fat. Some of the reduction in milk fat consumption will be partially offset by expected increases in cream and ice cream consumption, and the EU intervention program may purchase some of the additional butter supply. Still, should excess milk fat go toward increasing EU butter production, it will decrease the latent butter gap opportunity for the U.S. To better understand the full implication of this trend, the U.S. should monitor skim and semi-skim milk consumption in Germany, Italy and Eastern Europe, as well as stay informed about policy changes to the EU intervention program. Additionally, while the trend toward lower fat milk is not yet evident in emerging markets, it also bears watching.

Threat of substitutes

Dairy substitution in ingredient applications is generally driven by rising dairy prices or price volatility, while dairy substitution in end-products (e.g., fluid milk, cheese, yogurt) is more often driven by health or dietary considerations. Though end-products such as soy beverages have grown rapidly in recent years, they do not presently represent a significant threat to dairy in the foreseeable future due to their small market share. Instead, it is the substitution of dairy ingredients that could have a more meaningful impact on overall dairy demand.

Dairy ingredients are generally considered to be superior in flavor and function to non-dairy substitutes, but the increasing incidence of unexpected spikes in cost has driven some consumer goods companies to relatively more price-stable substitutes, such as soy protein, maltodextrin and other vegetable proteins. Since companies are generally unwilling to share

their product formulations, the rate of substitution is hard to estimate. Third party sources indicate that while dairy substitution is prevalent, the transition to substitutes is slow due to dairy performance, consumer preferences and an overall reluctance to re-formulate. However, sustained high prices and/or volatility—such as what the industry experienced in 2007-2008—could quicken the rate of substitution. Additionally, companies are slow to return to dairy ingredients—even if prices fall—because of the wariness to reformulate and the associated costs of doing so. Therefore, once a customer is lost, it can be very difficult to win back.

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Dairy Trade Globalization:
Analysis, Implications and Recommendations

August 2009

This document, prepared by the Innovation Center for U.S. Dairy, contains research and analysis conducted with the support and assistance of Bain & Company, a global management consulting firm

Goals for this discussion

- Provide an overview of project objectives/approach
- Review the expected evolution of the global dairy industry and the implications for U.S. dairy
- Discuss strategic options for the U.S.
- Recommendations for developing the appropriate option

Original project objectives defined by the Task Force

Primary: Provide a strategic analysis of the global dairy landscape to provide a common understanding of the challenges, opportunities and threats posed by increasing globalization to the U.S. dairy industry

Secondary: From the analysis, determine if there are suitable programs of work at the industry level to address the opportunities and challenges of globalization

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Thank you to the Task Force that has dedicated many hours to this project over a period of approximately 6 months

Task Force

- Kevin Toland, Glanbia (Chair)
- Keith Murfield, United Dairymen of Arizona
- JP Ruiz Funes, Land O'Lakes
- Jay Waldvogel, Dairy Farmers of America
- John Underwood, Darigold
- Richard Cotta, California Dairies, Inc.
- Steve Shelley, Schreiber Foods
- Sue Taylor, Leprino Foods

Company Captains

- Carol Kitchen, Land O'Lakes
- Dermot Carey, Darigold
- Jimco Hrusovszky, United Dairymen of Arizona
- Lavonne Dietrich, Dairy Farmers of America
- Niamh Kelly, Glanbia

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Key themes

1. **Globalization of the dairy industry will increase** in the coming years, with significant impact on domestic and international trade
2. **Demand for dairy products will grow faster than available supply**, driven disproportionately by emerging markets
3. However, **traditional sources of supply will not be able to fully meet growing dairy demand**
4. Global imbalances will create **increasingly volatile dairy markets,** as processors must compete across borders for milk supplies
5. Shortage of global supply creates **internal and external growth opportunities** for the United States
6. To capture this opportunity, the U.S. Dairy Industry will **need to leverage existing capabilities** and **invest in strengthening specific competitive weaknesses**
7. **Inaction will lead to a less competitive** U.S. industry
8. Longer term, new **low-cost supply (Brazil, Ukraine) will compete for a larger share of the global opportunity**, creating a finite window for the U.S. to establish a defensible competitive position

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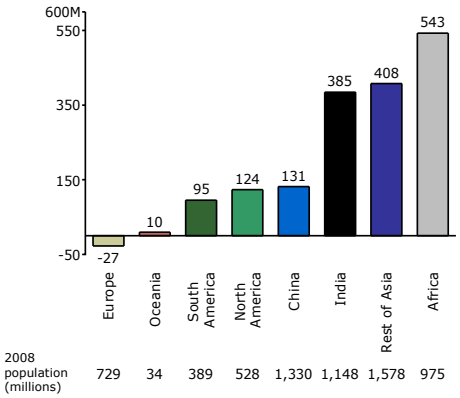
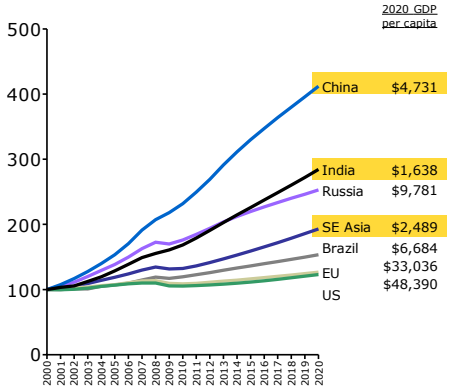
Future world economic and population growth will be driven by emerging markets

World population growth forecast (2008-2030)



Real GDP per capita indexed from 2000



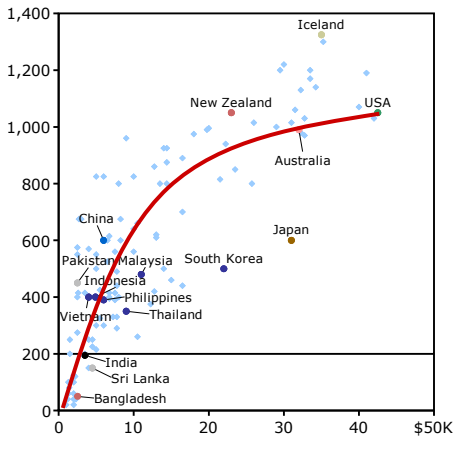
Dramatic increase in middle-class consumers (~800 million consumers by 2030)

Source: US Census Bureau international database

As economies create wealth, consumption of animal protein (and dairy) will increase

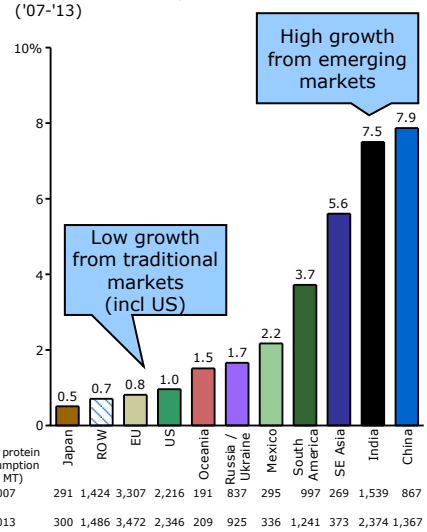
GDP per capita ($ppp) and animal protein consumption (includes fish and dairy)

Animal protein Kcals per capita per day



Projected dairy protein consumption growth p.a., 2007-2013

Dairy protein consumption CAGR ('07-'13)

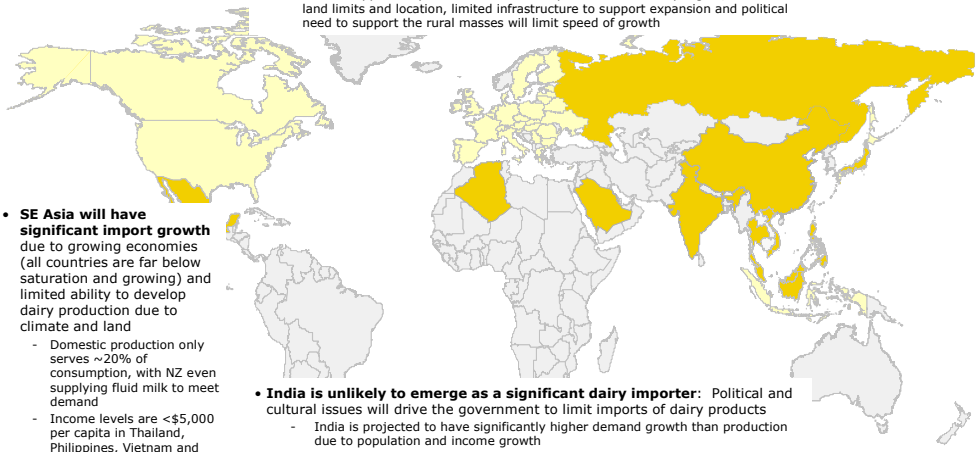


Source: "Opportunities for Australian Agriculture" - Australia Farm Institute

Most importers have growing dairy demand

Key importer

- **China will continue to be a significant dairy importer** with consumption growing faster than production in the foreseeable future
  - Dairy demand will be driven by income growth and urbanization, with higher value-added products growing in Tier 1 regions
  - There is opportunity to continue to develop the northern dairy region, but arable land limits and location, limited infrastructure to support expansion and political need to support the rural masses will limit speed of growth



- **SE Asia will have significant import growth** due to growing economies (all countries are far below saturation and growing) and limited ability to develop dairy production due to climate and land
  - Domestic production only serves ~20% of consumption, with NZ even supplying fluid milk to meet demand
  - Income levels are <$5,000 per capita in Thailand, Philippines, Vietnam and Indonesia, but expected to grow significantly

- **India is unlikely to emerge as a significant dairy importer**: Political and cultural issues will drive the government to limit imports of dairy products
  - India is projected to have significantly higher demand growth than production due to population and income growth
  - Government will either have to support increased production or will allow pricing to dampen consumption growth

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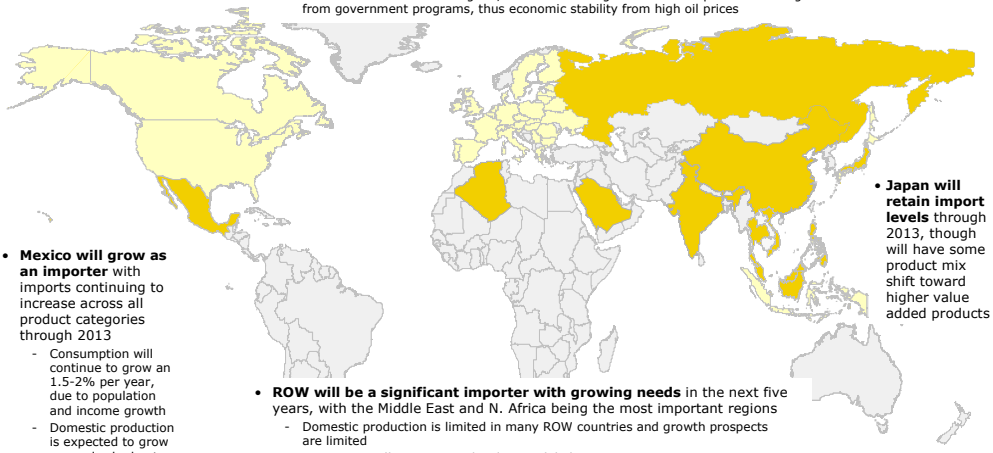
Note: The US and EU are both major importers and exporters of dairy products

Most importers have growing dairy demand

Key importer

- **Russia will decrease imports** over the next five years, but will continue to be a net importer of dairy (mainly from CIS countries)
  - Demand per capita will continue to grow as the economy expands, but expected population decline will temper consumption growth
  - Production will continue to grow, but accelerated growth would depend on funding from government programs, thus economic stability from high oil prices



- **Mexico will grow as an importer** with imports continuing to increase across all product categories through 2013
  - Consumption will continue to grow an 1.5-2% per year, due to population and income growth
  - Domestic production is expected to grow more slowly due to low yields per cow

- **Japan will retain import levels** through 2013, though will have some product mix shift toward higher value added products

- **ROW will be a significant importer with growing needs** in the next five years, with the Middle East and N. Africa being the most important regions
  - Domestic production is limited in many ROW countries and growth prospects are limited
  - Economies will continue to develop as globalization continues, suggesting increasing GDP per capita, thus increasing demand for dairy protein

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Note: The US and EU are both major importers and exporters of dairy products